AGREEMENT

This Agreement is made by and between the American Association of State Highway and Transportation Officials, Inc. a corporation of the District of Columbia, with offices at 444 N. Capitol St. N.W., Suite 249, Washington, D.C. 20001, hereinafter referred to as the "ASSOCIATION," and Arizona Department of Transportation, with offices at 206 South 17th Avenue, Phoenix, Arizona, hereinafter referred to as the "MEMBER DEPARTMENT."

WITNESSETH

Whereas, the ASSOCIATION is operating the National Transportation Product Evaluation Program, hereinafter referred to as the "NTPEP", which requires that testing of certain materials, products and devices be carried out and reported in a prescribed manner approved by the ASSOCIATION; and

Whereas, the MEMBER DEPARTMENT is willing to carry out testing of certain materials, products and devices as specified herein, in accordance with the procedures established by the ASSOCIATION for the NTPEP:

Now, Therefore, in consideration of the mutual covenants and agreements hereinafter set forth, the sufficiency of which is hereby acknowledged, the ASSOCIATION and the MEMBER DEPARTMENT agree as follows:

1. Technical Assistance

(a) The MEMBER DEPARTMENT shall do the test deck evaluations and furnish the data to Virginia Department of Transportation as outlined in the attached "Project Work Plan for Field and Laboratory Evaluations of Sign Sheeting Material," hereinafter referred to as the "Project Work Plan," which is hereby incorporated into this Agreement.

(b) The MEMBER DEPARTMENT is equipped and qualified to do the test deck evaluations and furnish the data to Virginia Department of Transportation as outlined in the Project Work Plan.

(c) The MEMBER DEPARTMENT shall furnish all necessary personnel, materials, facilities, equipment, service and all other resources and capabilities necessary or desirable to do the test deck evaluations and furnish the data to Virginia Department of Transportation as outlined in the Project Work Plan.

(d) The MEMBER DEPARTMENT agrees in performing the test deck evaluations and furnishing the data to Virginia Department of Transportation as outlined in the Project Work Plan, it will do

the work in an acceptable workmanlike manner, as determined by the ASSOCIATION and in conformance with general practice as recognized by the state departments of highways and transportation that comprise the ASSOCIATION.

2. Period of Performance

(a) The MEMBER DEPARTMENT shall complete the work described in the Project Work Plan in accordance with the following general schedule:

1. Test panels will be fabricated by Virginia Department of Transportation in April 1997. The panels will be shipped from Virginia to Arizona as soon as practical and the sign sheeting materials will be installed on the field test decks no later than June 1997.

2. Status reports will be made to the coordinator every six months.

3. Test data for inclusion in the interim report will be sent to Virginia Department of Transportation by July 1, 1998 and test data for inclusion in the final test deck report will be sent to Virginia Department of Transportation by July 1, 1999.

(b) Whenever the MEMBER DEPARTMENT knows, or reasonably should know or anticipates, that any condition beyond its control is delaying or threatens to delay the timely performance of the testing work and the making of timely reports, it shall advise ASSOCIATION of the actual or expected delay, the cause thereof, and the then expected completion date of the testing work and reports.

3. Costs and Payments

(a) The cost per sample (test deck evaluation only) under this Agreement and the Project Work Plan shall be one hundred dollars ($100.00) per sample color adhesive and type. This amount is a fixed price per sample tested,(test deck evaluation only) and furnish data to Virginia Department of Transportation for the interim and final reports. It is agreed that in no event will the ASSOCIATION pay the MEMBER DEPARTMENT for costs incurred in excess of the fixed price per sample, unless a mutually acceptable separate written agreement is entered into between the parties.

(b) If testing work under this Agreement is terminated by the

ASSOCIATION without cause, the amount payable to the MEMBER DEPARTMENT will be in proportion to the percentage of completion of the testing work as described in the Project Work Plan, as of the effective date of such termination or suspension.

(c) The ASSOCIATION shall make payments to the MEMBER DEPARTMENT in accordance with the following procedure:

1. The MEMBER DEPARTMENT shall submit an invoice to the ASSOCIATION for reimbursement for the test deck evaluation work when it has completed all the evaluations on the samples and furnished data to Virginia for all the approved products as identified by the NTPEP Coordinator at the fee schedule outlined in (a) above, payable to the MEMBER DEPARTMENT under this Agreement, and the invoice being supported with accepted accounting principles and procedures.

2. Upon written request by and at the expense of the ASSOCIATION, the MEMBER DEPARTMENT shall permit a designated representative of the ASSOCIATION to inspect, copy and audit the MEMBER DEPARTMENT's books and records relating to the performance of this Agreement.

4. Stop Work Order

The ASSOCIATION may, upon not less than a ten day written notice to the MEMBER DEPARTMENT, require the MEMBER DEPARTMENT to stop all, or any part of the work called for by this Agreement. Upon receipt of such a stop work order, the MEMBER DEPARTMENT agrees to comply with its terms and take all reasonable steps to minimize the incurring of additional costs allocated to the work covered by the stop work order during the period of work stoppage.

5. Termination

(a) This Agreement may be terminated by the ASSOCIATION with a 30-day written notice to the MEMBER DEPARTMENT. In the event of termination by the ASSOCIATION without cause, the MEMBER DEPARTMENT shall be paid all costs and obligations incurred in accordance with this Agreement prior to the date of termination. Such reimbursement, together with other payments already made, shall not exceed the per sample cost times the number of samples approved for testing by the NTPEP Coordinator.

(b) This Agreement may be terminated by the MEMBER DEPARTMENT with a

30-day written notice to the ASSOCIATION.

(c) Upon termination of the Agreement prior to its full term, the MEMBER DEPARTMENT agrees to provide to the ASSOCIATION all data collected up to the time of termination, and to provide required reports through such termination date.

6. Reports

(a) Interim reports shall be prepared and delivered to the ASSOCIATION as required in the Project Work Plan.

(b) After completion of the testing work, or upon termination of this Agreement under Section 5, the MEMBER DEPARTMENT shall make a final reporting in the manner described in the Project Work Plan.

7. Indemnification

(a) To the Extent provided by law, the MEMBER DEPARTMENT hereby assumes its responsibilities for any loss resulting from bodily injuries (including death) or damages to property, arising out of any act or failure to act on the MEMBER DEPARTMENT's part, or the part of any employee of the MEMBER DEPARTMENT in the performance of the work undertaken under this agreement and contract.

(b) To the Extent provided by law, the ASSOCIATION hereby assumes its responsibilities for any loss resulting from bodily injuries (including death) or damages to property, arising out of any act or failure to act on the ASSOCIATION's part, or the part of any employee of the ASSOCIATION in the performance of the work undertaken under this agreement and contract.

8. Proprietary Rights to Data

It is agreed that the ASSOCIATION shall be the owner of and shall have the exclusive proprietary rights, to the exclusion of the MEMBER DEPARTMENT, to all data and reports resulting from this Agreement, shall hold copyright thereto, and have the exclusive right to publish, disclose, disseminate and use in whole or in part any data and information received or developed under this Agreement.

9. Term of the Agreement

The term of this Agreement shall be for the period as stated in the Project Work Plan, measured from the effective date of the Agreement.

10. Effective Date

This Agreement shall become binding on the parties hereto and of full force and effect upon the signing thereof by the duly authorized officials for the ASSOCIATION and the MEMBER DEPARTMENT, the effective date being that upon which the last party hereto executes the Agreement as stated below.

11. Jurisdiction

This Agreement shall be construed in accordance with and governed by the laws of the District of Columbia and the State of Arizona.

12. Interpretation

Where interpretation of the Project Work Plan and the terms of this Agreement becomes necessary, recourse shall first be had to the operating procedures established by the ASSOCIATION for the NTPEP, including the appeals process thereof.

13. Completeness

This Agreement is the complete and exclusive statement of the arrangement between the parties, and supersedes all proposals, oral or written, and all other communications between the parties relating to the subject matter thereof. It may be amended from time to time in writing by the mutual consent of the parties hereto.

14. Communications

All communications concerning this Agreement, including invoices and reports, shall be sent to:

For the ASSOCIATION:

Steven E. Lenker, NTPEP Coordinator
AASHTO
444 N. Capitol St. N.W. - Suite 249
Washington, D.C. 20001

For the MEMBER DEPARTMENT:

Mr. Doug Forstie
Assistant State Engineer
Materials Group
Arizona Dept. of Transportation
206 South 17th Avenue
Phoenix, Arizona 85007

with copy to:
Department of Transportation
Joint Project Administration
205 S. 17th Avenue MD 616E
Phoenix, AZ 85007

In Witness Whereof, the parties have set their hands and seals by their duly authorized agents and representative on the day and year below written:

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, INC.

Witness _____

By: _____

Date 1-6-97

Title _____

(SEAL)

ARIZONA DEPARTMENT OF TRANSPORTATION

Witness _____

By: _____
AUGUST V. HARDT

Date 1-6-97

Title Deputy State Engineer

(SEAL)

NATIONAL TRANSPORTATION

PRODUCT EVALUATION PROGRAM (NTPEP)

PROJECT WORK PLAN FOR THE

FIELD AND LABORATORY EVALUATION OF

SIGN SHEETING MATERIALS

Approved December 1995
(Editorial Revision October 1996)

FIELD AND LABORATORY EVALUATIONS OF SIGN SHEETING MATERIALS

Sign Sheeting Manufacturers wishing to participate in the AASHTO National Transportation Product Evaluation Program must submit a product evaluation form (PEF) to the AASHTO NTPEP Coordinator by *February 15, 1997.* The Product Evaluation Form must include Material Safety Data Sheets on the process color inks to be used with the sheeting along with other pertinent information. The AASHTO NTPEP Coordinator will assign each material a number as indicated below:

(examples)

SSM-9X-1	Manufacturer "A" Engineer Grade Pressure Sensitive Sheeting
SSM-9X-2	Manufacturer "A" Engineer Grade Heat Activated Sheeting
SSM-9X-3	Manufacturer "B" High Performance Grade Pressure Sensitive Sheeting
SSM-9X-4	etc.

The manufacturer will be notified by February 22, 1997 of the NTPEP Coordinator's decision to test their material. At a later date the manufacturer will also be notified by the Virginia DOT where to ship the material for testing. The materials will be sent to a sign shop in Virginia DOT. Suppliers will submit to the assigned sign shop one roll of sign sheeting material approximately 1 meter (36 inches) wide by 15 meters (50 feet) long of each color and adhesive backing they have elected to have tested and evaluated.

The process color inks to be used with this sheeting must also be sent to the sign shop. The process colors suppliers have elected to have tested and evaluated should be one or more of the following colors: red, blue, green, orange and black.

The samples must be clearly labeled with the assigned SSM-9X- number. The sample identification should include lot no., batch no., drum no., etc. The samples of material must arrive at the sign shop by April 1, 1997.

A week in April convenient to the sign shop will be assigned to fabricate test panels for outdoor exposure testing. Representatives of the manufacturers are requested to be present to provide guidance and expertise in the handling of their specific product.

If ink is submitted, it is particularly important that the representative be completely familiar with the ink application process. Manufacturers will normally be expected to arrange for disposal of leftover ink if it is not compatible with the Sign Shop waste stream. Virginia retains the right to recover from the manufacturer any excessive cost which results from disposal of surplus material.

SIGN SHOP PROCEDURE

1. Lead State Coordinator meets with Sign Shop Foreman and Manufacturer's Representative. Coordinator outlines procedure to track material. Coordinator explains that the sign shop personnel are at the disposal of the Representative, whatever directions or recommendations he suggests will be carried out. The sign panels will be 100 mm x 300 mm x 2.5 mm (4" x 12" x 0.1"), the aluminum alloy to be 5052. The Representative may reject any test panel.

2. State Coordinator records all information on materials for testing: Item No., color, size, Lot No., etc. for sheeting and ink submitted.

3. State Coordinator assigns number to each color and ink combination submitted.

4. Aluminum sign blanks have some defects from the manufacturing, packaging and shipping processes. The Representative and the sign shop personnel may reject any panels they deem unacceptable.

5. Aluminum sign blanks shall be prepared in accordance with ASTM D4956, Subsection 8.2 before application of sheeting.

6. Sheeting will be applied according to manufacturer's recommendation using only equipment available in the sign shop.

   It will be applied three different ways.

   (A) Pressure-Sensitive sheeting may be applied by placing the 100 mm x 300 mm (4" x 12") panels on a large aluminum sign blank. The sign blank will then run through a pressure sensitive applicator.

   (B) Pressure-Sensitive sheeting may also be applied by small hand applicators.

   (C) Heat-Activated sheeting will be applied by vacuum and heat.

7. Inks are applied according to the manufacturer's recommendation. The ink covers an area 75 mm x 280 mm (3" x 11") leaving approximately 10 mm (½") border around the edge of the panel for handling purposes.

8. Screen size used with the ink:
   Monofilament White Mesh No.158 HITECH thread diameter 64 microns

(0.0025"), mesh opening 90 microns (0.0035"), open areas 32%, 2 meter (80") width.

9. The Manufacturer's Representative will be allowed to select the panels that will go to the test deck sites in *(5 different State DOT locations)*.

10. Once the panels have been selected for the test deck a sample of sheeting approximately 4 meters (12 feet) in length and 1 meter (36 inches) wide will be sent to Louisiana DOTD for laboratory testing.

TEST PANEL PREPARATION AND TRACKING PROCEDURE

The manufacturer submits their sign sheeting material to the designated Virginia DOT sign shop for test panel preparation. The sign shop cooperating with the company representative fabricates test panels for outdoor weathering at AASHTO NTPEP Test Decks. The sign panels are 100 mm x 300 mm (4" x 12"). The following quantities of panels will be fabricated.

5 panels per test deck for each color of sheeting selected for testing and evaluation.

10 panels per test deck for each color ink selected for testing and evaluation.

Extra panels will be made if necessary.

The manufacturer will examine all the panels fabricated and give his approval before any of the panels are inked. After approval of the panels fabricated with each of the selected sheeting color, *(3 per test deck)* panels will be selected to go to the AASHTO NTPEP test decks while the remaining selected color panels will be inked according to the following scenario with extra panels being made when necessary.

6 per test deck panels of each selected sheeting color with each ink color selected

Each panel will receive a number for tracking purposes. The numbers run consecutively from 1 to 10,000 beginning with the first available number for the year in which the panels are made.

The manufacturer will examine all the above panels and select *three* panels of each sheeting and ink combination to go to *each of* the AASHTO NTPEP test decks.

The panels selected per color and ink combination that are to go to the test deck will

be assigned the first available number for the year along with a letter (e.g. 551A). *One third* of the (same color) panels will be assigned the letter A. *One third* of the (same color) panels will be assigned the letter B. The other *One third* of the (same color) panels will be given a letter C.

The process will continue until all panels have been given a number and a letter

The number and letter combination will then be etched on the back of each sign panel with an electric engraver.

One set of panels will be sent to each of the AASHTO NTPEP Test Decks.

One set of panels is defined as the 3 panels of each color sheeting and ink submitted by the supplier per test deck site and labeled as follows:

Example:

551A, 551B, 551C

552A, 552B, 552C

553A, 553B, 553C

etc.

Two

A set of these test panels will also be sent to each AASHTO NTPEP test deck: one in Louisiana, one in Minnesota, one in Arizona, one in North Carolina, one in Virginia. A test deck consists of a number of Outdoor Exposure racks facing south and inclined at an angle of 45 degrees from the horizontal as stated in ASTM G7-89.

TEST DECK LOCATIONS

Arizona`s test deck is located in a hot dry climate and 2nd deck in the ~~mountains.~~ higher and Cold Climate (7000)

Louisiana`s test deck is located in Baton Rouge at the Louisiana D.O.T.D. Traffic Services Section on Tom Drive.

North Carolina's test deck is located at its Wilmington Division of Highways Headquarters about 15 miles from the Atlantic Ocean in Wilmington, North Carolina.

Minnesota`s test deck is located near the Maplewood test laboratory north of St. Paul, Minnesota.

Virginia's test deck is located at its McDowell Area Headquarters on Route 250 between the Shenandoah Mountains and the Allegheny Mountains near the Virginia, West Virginia border.

TEST DECK PROCEDURE

1. Each Test Deck will receive 3 panels for each color per type selected for test by the suppler and labeled xA, xB, and xC.

2. Each panel received by the test deck will be examined closely. Any minute flaw will be recorded in a notebook.

3. Initial Coefficient of Retroreflection Values for panels xA, xB, xC, and etc. (x = 551, 552, 553, etc.) will be measured in a 15 or 30 meter (50 or 100 foot) Light Tunnel in accordance with ASTM D4956, Subsection 8.3. The Coefficient of Retroreflection value will be recorded at an observation angle of 0.2 degrees and an entrance angle of -4 degrees and +30 degrees. The rotational angle will be 0 and 90 degrees. The rotational angle of 0 degrees is when the number and letter on the back of the panel are at the top (closest to the light source).

4. Initial chromaticity will be measured in accordance with ASTM D4956, Subsection 8.4 and recorded on panel A, B and C of each number. Panel C will be retained in the laboratory for comparison purposes. Final chromaticity values for panel A and B will obtained and indicated in the final report.

5. Initial portable reflectometer readings will be taken. Each panel shall be measured on the top, middle, and bottom. The average of these readings on each panel shall be recorded on the report. In the case of barricade or other preprinted sheeting, the different colored areas will be read separately.

6. Panels labeled xA and xB will be placed on the outdoor exposure racks on June 1, 1997 or as soon as possible thereafter.

7. Panels labeled xC will be stored in a file cabinet or other suitable storage place protected from the sunlight and weather.

8. Portable reflectometer readings of panels A, B and C will be made initially, at 6 months, 1 year and 2 years. The test panel will be wiped with a soft damp cloth and allowed to dry prior to being read with the portable reflectometer. The control panel will be read at the test deck site at the same time the test panels are being read.

9. Visual comparison with the control sample will be made at 6 months, 12 months and at the end of two years. Samples will be evaluated as to colorfastness, shrinkage, expansion, blistering and cracking.

10. Panels labeled xA and xB (x = 551,552,553 etc.) will be taken down from the Outdoor Exposure Rack June 1, 1999.

11. Final Coefficient of Retroreflection values from Panels xA, xB and xC will then be measured in the same 15 or 30 meter (50 or 100 foot) light tunnel in which the initial Coefficient of Retroreflection values were obtained. The test panels will be washed with distilled water and dried prior to measurement. Values shall be obtained as described in Paragraph 3 above.

12. Final evaluation for colorfastness, shrinkage, blistering and cracking will be made. In addition to visual observations for colorfastness, chromaticity values will be taken in accordance with ASTM D4956, Subsection 8.4.

13. Findings will be reported to AASHTO NTPEP Sign Sheeting Committee.

14. If possible Panels xA and xB will be returned to the Outdoor Exposure Racks within 2 weeks for additional exposure if the individual state agrees to perform the extra testing.

15. Weather information from the National Weather Service station nearest each test deck will be summarized and recorded in the final report.

VISUAL RATING SYSTEM

COLORFASTNESS - L-S-300C SUBSECTION 4.4.9.1

This Colorfastness rating is taken entirely from L-S-300C, Subsection 4.4.9.1 except the evaluation is done without wetting samples. Holding dry control panel C beside dry test deck panels A and B evaluate them as follows:

Excellent - No perceptible change in color

Good - Perceptible change in color

Fair - Appreciable change in color

Poor - Color not recognizable as original color

Appreciable change in color means a change that is immediately noticeable when making the comparison. It should be noted that the difference between the "Excellent" and "Good" categories is small. As with any subjective evaluation, it is dependent on the operator and light conditions at the test site.

SHRINKAGE - L-S-300C SUBSECTION 4.4.9.2

Shrinkage will be reported as the number of mm (inches) between edge of the sheeting and the edge of the Aluminum panel at two years. Expansion will also be noted in this category.

CRACKING

This category will evaluate sheeting or the ink on sheeting for cracking, crazing or scaling. An abbreviation will be made on the report form. The explanation of the abbreviation will appear in the Notes on Visual Data Collection.

BLISTERING

This category will evaluate sheeting or the ink on sheeting for Blisters, Delamination or Edge Lifting. An abbreviation will be made on the report form. The explanation of the abbreviation will appear in the Notes on Visual Data Collection.

LABORATORY EVALUATIONS

Upon completing the preparation of the panels for the outdoor test decks, samples of the remaining sheeting will be received from Virginia DOT for evaluation in the Louisiana DOTD Materials and Testing Laboratory. Test methods used in evaluation of the sign sheeting materials shall be as listed in Table 1.

TABLE 1
TEST METHODS USED IN EVALUATION
OF RETROREFLECTIVE SIGN SHEETING

Tests Performed	Fed. Spec. L-S-300C	ASTM D4956-94	Comments
Adhesion: Protective Liner Removability Adhesive Peel Strength		 8.10 8.5	
Flexibility		8.9	
Impact Resistance		8.11	
Heat Resistance	4.4.10.1		
Cold Resistance	4.4.10.2		Tested at -20 °F
Humidity Resistance	4.4.10.3		Tap water used in testing
Shrinkage		8.8	
Daytime Color: *Fluorescent colors*		8.4 *E 991-90*	
Luminance Factor (Y%): *Fluorescent colors*		8.4 *E 991-90*	
Specular Gloss		8.12	
Coefficient of Retroreflection		8.3	
Reboundable Sheeting:			
Impact Resistance		S2.2.1	
Flexibility		S2.2.2	
Adhesion		S2.2.3	